ON A CASE

OF

ELEPHANTIASIS ARABUM

(OR ELEPHAS),

SUCCESSFULLY TREATED BY

THE APPLICATION OF A LIGATURE TO THE MAIN ARTERY OF THE LIMB;

WITH REMARKS.

BY

THOMAS BRYANT, F.R.C.S. Eng.,

ASSISTANT-SURGEON TO GUY'S HOSPITAL.

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Received May 8th.—Read June 26th, 1866.

Elephantiasis Arabum, Barbadoes leg, Cochin leg, or, more properly, Elephas, although generally regarded as a tropical disease, is not infrequently met with amongst the inhabitants of this island; it is to be looked upon as a local affection, as depending on certain local changes, being quite distinct from the severe constitutional disease—the true leprosy—which has been described as an Elephantiasis Græcorum.

It is in the majority of instances confined to one part of the body, or to a single limb, but at times it may simultaneously involve two or more; it has hitherto completely baffled all ordinary medical or surgical skill, and the only

effective treatment has been amputation or excision of the diseased growth. Could any means, consequently, be hit upon by which this hitherto intractable affection might be brought within the category of curable affections, without involving the sacrifice of a limb, it would be hailed with satisfaction, and as a contribution to such an end the following case has been brought before the notice of this Society. It is the first, I believe, which has been so treated in this island, and the success of the result is, without doubt, encouraging.

(Reported from the notes of Messrs. C. SANGSTER, GEORGE ROOTES, and BENJAMIN DUKE.)

Mary T—, æt. 25, the daughter of Welsh parents, and a native of Carmarthen, was admitted into Petersham Ward, Guy's Hospital, on October 10th, 1865, under the care of Mr. Thomas Bryant, the case having been sent to him by Mr. Rowland, surgeon, of Carmarthen. She was a single woman, of a healthy aspect, and had always enjoyed good health, never having had any illness of much importance. Ten years previously she had scarlet fever of a mild type, unaccompanied by any of its ordinary complications, and it was during her convalescence from this disease that the left leg began to swell, the swelling beginning in the calf and extending upwards towards the knee; it was unattended by pain or any indication of general disease.

For two years the enlargement gradually increased, when she slept in a damp bed, after which the disease progressed more rapidly and extended upwards, involving the thigh; the increase was still, however, perfectly painless. Four years afterwards she was admitted into the Carmarthen Infirmary, and was under treatment for three months—hot baths, rest, and pressure by bandaging being employed; this treatment failed, however, to make the slightest impression on the disease, the limb steadily going on increasing.

Eighteen months after this she applied to the Swansea Hospital, where the limb was bandaged, and for some days cold was locally applied; other treatment was also tried, but

all without effect. Three years since, some small ulcers appeared between a deep sulcus in the enlarged calf, and from one of these, the girl states, a quantity of black fluid, like blood, escaped; the wound subsequently healed, but during last summer it reopened, again discharging a like fluid; the cicatrix still exists.

On admission the left leg was found to be enormously enlarged from the ankle to the groin; to the hand it felt hard and brawny, the skin and cellular tissue being evidently infiltrated with a fibrinous material. At the posterior part of the calf of the leg, and behind the knee, there were several sulci, and in one of the lowest and deepest there was distinct evidence of an old sore, this spot being the one from which the patient states the black fluid had formerly escaped. The skin appeared to be generally coarse, but it was free from the cuticular induration and ulceration which is so frequently associated with this affection. It is to be noted that the foot was perfectly sound.

The measurements on admission were as follows:

Round the left or diseased calf, 24 inches; round the right, 15½ inches; round the diseased thigh, 28 inches; round the right, 21 inches.

The temperature of both limbs appeared to be alike; the pulsation in the left iliac artery was clearly to be felt, but the femoral and tibial vessels of the affected limb could not be made out. The patient was ordered to be kept in bed, and the leg to be well raised on an inclined plane.

On October 13th, or second day, the limb had diminished one inch. On the 16th of October, or fifth day, it had lost another half inch—the calf measuring 22½ inches, and the thigh 27 inches. On October 18th, or seventh day, no further decrease had taken place.

The same treatment was, however, persevered with for another fortnight without intermission, but without benefit, the limb having measured at the end of that time, on October 31st, as follows:

Calf of affected leg, 22½ inches; of sound leg, 14 inches;

thigh of affected limb, 27 inches; of sound limb, 20 inches. (See Plate IV.)

On October 31st, the patient being under the influence of chloroform, Mr. Bryant applied a ligature to the external iliac artery, the vessel appearing to be perfectly healthy and of natural size. The whole limb was subsequently swathed in cotton wool and raised as before.

November 1st, 10 a.m.—She has vomited several times during the night, and slept but one hour; complains of some pain in the wound; the limb is quite warm, and evidently much softer. Mr. Bryant, at 2 o'clock, took the following measurements:

Calf of leg, $21\frac{1}{2}$ inches instead of $22\frac{1}{2}$ inches; thigh of leg, $25\frac{1}{2}$ inches instead of 27 inches.

3.30 p.m.—Vomited once only since the morning; complains of the right or sound limb being colder than the left; to the hand the right foot feels cold; pulse 116. Hot-water bottle ordered to right foot; brandy ℥ij, with ice to check sickness.

2nd, 10 a.m.—Passed a good night, being free from pain; pulse 120, of good power; tongue clean; no return of vomiting; left leg quite warm and free from pain, right comfortable.

3.30 p.m.—Sutures were removed from the wound, when some pus escaped; has taken some meat for dinner.

3rd, 10 a.m.—Has had a restless night and has a slight headache; wound has discharged freely; there is a slight blush around its edges and some tenderness; the limb is perfectly warm.

3.30—Mr. Bryant to-day made gentle pressure around the wound, and some pus escaped; hot fomentations were ordered to be applied.

4th, 11 a.m.—Did not get any sleep last night till 2 a.m., and then only for one hour; the wound has discharged freely and is less painful; the inflammatory blush is subsiding; pulse 70; tongue clean; bowels have not been open since the operation.

Ordered Pulv. Rhei Salin. gr. x horâ somni.

5th.—Much better to-day, having passed a good night.

6th.—Passed a good night. Is free from all pain. Limb is quite comfortable, and is still wrapped up in cotton wool; it has not been opened for several days.

8th, 3 p.m.—The limb was unwrapped to-day, the eighth after the operation, and found to be perfectly warm and comfortable; it was evidently much smaller and softer, the latter fact being very marked. The calf measures $19\frac{1}{2}$ inches, and the thigh 24 inches, or 3 inches less since the operation. The limb was then wrapped up in flannel. The wound looked very healthy.

12th.—Is going on well in all respects. Wound healing, limb becoming softer daily. The calf of the leg is quite baggy.

15th.—The ligature came away to-day without the slightest stain of blood, it being the fifteenth day after the operation. The calf of leg measured $18\frac{3}{4}$ inches, and thigh 23 inches, having again diminished about 1 inch in the last or second week.

12 p.m.—There was a slight oozing of blood from the wound, which continued till 6 a.m. on the 16th, when it ceased.

17th.—Wound looks healthy, leg warm and softer.

18th.—The limb was measured to-day, the calf measuring 18 inches, and thigh 23 inches.

24th.—The wound has nearly healed, and the limb is quite soft. The girl complains of her foot feeling somewhat cold. Cotton wool was therefore applied. Quinine mixture ordered, with wine ℥vj.

28th.—The calf measured $17\frac{1}{2}$ inches.

30th.—The wound has perfectly healed; in all respects the girl's health is good.

December 6th.—Everything is going on well. The calf was measured, and found to be only 17 inches (being 7 inches less than it was the day before—the iliac artery was ligatured five weeks since).

13th.—The calf measured to-day $16\frac{7}{8}$ inches. All brawniness of the thigh has disappeared; to the hand it feels just like the other.

23rd.—Has had an elastic bandage applied to-day from the toes to the hip, so as to allow her to get up for Christmas.

30th.—The limb was measured to-day and found to be $18\frac{1}{2}$ inches in circumference, being evidently œdematous, pitting on pressure. This enlargement was clearly due to the girl having been walking about during the Christmas week. The bandage was removed, and the horizontal posture ordered to be maintained.

January 10th.—The girl has been in bed since the 3rd, with the leg raised and without the bandage. The œdema of the limb has entirely subsided, the calf measuring $17\frac{5}{8}$ inches.

17th.—The calf measured 17 inches.

24th.—Ditto $16\frac{7}{8}$,,

31st.—Ditto $16\frac{3}{8}$,,

February 8th.—Ditto $16\frac{1}{4}$,,

14th.—Ditto 16 ,,

21st.—The induration in the calf of the leg has nearly disappeared, one portion only at the most dependent part feeling harder than natural. The calf measured $15\frac{7}{8}$ inches.

March 15th.—The calf measured $15\frac{1}{2}$ inches, and to the eye looked natural, very slight induration remaining.

April 15th.—The integument of the leg is rapidly contracting, and feels quite natural; all brawniness has disappeared. The girl may be pronounced well. A good elastic stocking ordered. (See Plate V.)

May 29th.—This patient is now quite well. She is walking about the ward without the slightest inconvenience.

Remarks.—It was from the perusal of a memoir on elephantiasis by Dr. Carnochan, of New York, published in 1858, that I was led to adopt the practice which the case just read so well illustrates; for he is, without doubt, the first surgeon who had the merit to suggest that in this disease the main artery of the diseased limb should be obstructed by a ligature, and the boldness to test the value of the idea by its practical application.

His first case was published in the 'New York Journal of Medicine' in September, 1852, and his last in the memoir to which I have just alluded, in 1858.

The following brief abstract of his cases may, perhaps, prove of interest.

Case 1.—Charles R—, a merchant, æt. 27, who was born in Aix-la-Chapelle, but bred in America, became the subject of elephas in the right leg, after an attack of intermittent fever, contracted in Virginia. He was admitted into the New York Emigrants' Hospital in January, 1851, with the right leg presenting a dense, hypertrophied, hard, scaly, and shapeless mass, the calf measuring $19\frac{1}{2}$ inches. The recumbent position, with the use of discutient lotions, bandaging, and the local as well as internal employment of the iodide of potassium, were for some time used without benefit, and on March 22nd, 1851, the femoral artery was ligatured a short distance below the origin of the profunda. The vessel on exposure was found to be changed, so as to present an appearance somewhat like the colour of the aorta of an ox, and to be larger than the common iliac of the human subject. The ligature came away on the eleventh day, accompanied by secondary hæmorrhage. The external iliac artery was then tied by Dr. Hosack, and was found to be about the size of the brachial. This for a time checked the bleeding, but on the following day it again recurred from the orifice in the femoral artery with as much profusion as ever. An attempt was then made to check the hæmorrhage by the application of a tourniquet on the cardiac side of the bleeding vessel, but without success, but when applied on the distal side a complete cessation of the bleeding was secured; from this time everything went on well. On April 12th, or three weeks after the first operation, the leg was found to have been considerably reduced in size, and the ligature came away from the external iliac artery. In June, three months after the operation, the patient left the hospital completely cured.

Sixteen months after this date the patient was reported to be in robust health, and presented no indication of a return of the disease.

Case 2.—On the 17th of April, 1857, Franeiseo P—, a native of Italy, æt. 39, was admitted into the Emigrants' Hospital at New York with "elephas" of the left leg, of six years' growth, the limb being so large that the patient was unable to follow any oceupation, or even to walk ; there was also extensive uleeration of the integuments. On May the 23rd the femoral artery was ligatured, the vessel appearing to be healthy and of its normal size. On July 1st, or the fortieth day, the ligature eame away. The limb rapidly beeame soft after the operation, and diminished in size. The uleeration of the skin also soon healed. The man left the hospital on August 24th, three months after the operation, with his limb almost its natural size, and able to walk well with but slight lameness.

Case 3.—Ann O'B—, a native of Ireland, æt. 25, was admitted into the hospital on November 27th, 1857, with elephas of the right leg of one year's growth, the disease having been preeeded by pain in the part for four years previously. On admission the foot, espeeially on the dorsum, was eonsiderably enlarged ; the leg was mueh inereased in size, the skin presenting thiek pachydermatous folds hanging over the ankle-joint, so as to prevent motion at the artieulation. The ealf on the diseased side measured $3\frac{1}{2}$ inehes more than on the sound.

On Deeember 12th, 1857, the femoral artery was tied, the vessel appearing healthy,and on the twenty-eighth day the ligature dropped off. The dense eharaeter of the tissues of the leg rapidly became soft after the operation, the folds of integument diminished, and the movements of the ankle-joint could soon be aecomplished. The ealf of the diseased leg, fourteen days after the operation, had gone down $1\frac{1}{2}$ inch, and when the ease was published, in January, 1858, the patient could walk with alacrity. After walking, however, for some

time without a bandage the limb became somewhat enlarged, evidently from œdema, for the tissues were then soft and compressible, and the limb was gradually regaining its natural condition.

Case 4.—Catherine P—, an Irish woman, æt. 26, entered the New York Hospital October 29th, 1857, for elephas of *both* legs. The disease had existed for three years, having been preceded by pain for some years previously. The right leg was the worst. On January 30th, 1858, the right femoral was tied, the vessel being healthy; the ligature came away on the twenty-third day. After the operation the tissues of the limb soon became soft and more natural; the size also gradually diminished.

The patient was so much satisfied with the result of the first operation, that she insisted on the artery of the left side being likewise tied. This was consequently done on April 17th, or two and a half months after the first ligature had been applied. When the case was published, eleven days after the operation, there was a decided amelioration in the condition of the limb, both as regards its diminished size, and the induration of the tissues.

It is to be regretted that no later report of this case has yet been published.

Mr. Statham's Case.—In 1858 Mr. Erichsen has recorded the fact that the late Mr. Statham, of University College Hospital, tied the anterior tibial artery for "solid œdema of the foot," with the effect of reducing the œdema. The patient, who was a middle-aged man, left the hospital relieved.

Mr. Butcher's Case.—In the 'Dublin Quarterly Journal' for 1863 Mr. Butcher has published a case in which he ligatured the femoral artery for elephas in the year 1861. It occurred in the person of Margaret D—, a woman æt. 44. The right leg was the part affected, and the disease had been growing for eighteen years, accompanied with severe

pain in the leg and foot. The calf of the diseased limb measured 5 inches more than the sound, and above the ankle 8½ inches. The femoral artery was tied on November 25th, 1861; the ligature came away on December 26th, and by the end of the sixth month the patient could walk well, without pain, the swelling having nearly all subsided. In May, 1863, eighteen months after the operation, the patient was reported as being still well.

Dr. Fayrer's Case. — In the 'Edinburgh Medical Journal' for November, 1865, there is a case related by Dr. J. Fayrer, of Calcutta, of a Bengalee, æt. 30, who was the subject of this disease in his right leg for seven years; the limb measured below the knee 19 inches, and the progress of the disease had been marked by periodic attacks of fever. On February 25th the femoral artery was tied, the limb becoming rapidly flaccid. On March 15th the patient unfortunately died from pyæmia, but the rapid diminution in the size of the limb, as Dr. Fayrer states, was so marked as to indicate the value of the treatment adopted.

In the 'Lancet' of March 24th, 1866, there is also a case related by Mr. Alcock, of the North Staffordshire Infirmary, in which the femoral artery was tied for elephantiasis, and when the report was made, one month subsequent to the operation, the result promised well.

With this brief outline of all such cases as have been published of "elephas," in which a ligature has been applied to the main artery of the limb for the object of its cure, I propose to pass on to consider the principle of the operation. From the facts which have been laid before this Society the practice certainly appears to be a good one.

The pathology of the disease is but little understood, for the opportunities of investigating its nature in this country are but rare.

Dr. Wise, of Calcutta, in a paper published in 1835 ('Transactions of the Medical and Physical Society of Cal-

cutta,' vol. viii), looked upon the disease as one of the venous system, and, what is more, as inflammatory; the evidence he adduces, however, to support this theory is not satisfactory.

Some authorities are disposed to regard the disease as one of the absorbent and lymphatic glandular system; others as a chronic inflammatory thickening of the skin and cellular tissue. Dr. Carnochan, in his memoir, mentions a condition which he looks upon as a fact—although he fails to give us the grounds of the opinion—that the disease is due to the morbid condition and dilatation of the principal arterial trunk of the member affected, and it was upon this idea that he was led to adopt the practice which the cases quoted appear to justify, although the observation as to the dilatation of the main vessel of the diseased limb has yet to be confirmed.

In the case I have just recorded the condition of the iliac vessel appeared to be sound, and in a second, in which I performed amputation of the leg in the year 1864, the vessel was also good. In all of Dr. Carnochan's own cases, with the exception of the first, the femoral artery has been described as being healthy.

What, then, it may be asked, is the pathological condition of a limb the subject of elephas? Dr. Wilks has described it "as a disease due to an exudation of lymph into the skin and subcutaneous tissue, whereby the former is hypertrophied and an immense thickening is produced beneath it, and, at the same time, the fat is often much increased in quantity. The skin also becomes brown, and a number of fissures occur, which subsequently change to oozing ulcers. In a true West Indian example of this affection the cuticle was found very much thickened and of a dark colour; the cutis was also thickened, and beneath there was a quantity of adventitious fibrous material and fat. The bones were healthy, and the veins leading to the diseased parts were exceedingly thickened. The state of the lymphatics was not made out." (Wilks' 'Pathological Anatomy,' p. 177.)

The pathological observations I have been able to make tend to prove the accuracy of these views, although it must be added that the condition of the veins, which Dr. Wilks has described as being thickened in the true West Indian example of elephas, is not the usual one as found in the majority of the cases occurring in this country. I had an opportunity of seeing the case described by Dr. Wilks, and the thickened patulous mouths of the veins in the diseased tissues were very marked, but in no other of the half-dozen or so of cases which I have been fortunate enough to see was the same condition present.

The case I have just brought before your notice tends to prove the fallacy of the opinion that this affection is due to an inflammatory thickening of the veins of the extremities, for the foot, it will be remembered, was uninvolved in the disease, and was quite free from all œdema; such a condition could hardly have existed had the enlargement of the limb been due to an obstruction of the main venous trunk, for œdema of the most dependent part would, under such circumstances, be looked for as an early symptom.

The microscopical elements of this thickened tissue are mostly uniform in all cases, for free nuclei, cells, and fibres, in all stages of growth and of development, are invariably to be found; the skin and cellular tissue appearing to be infiltrated with the same elements as go to build up a fibro-plastic tumour, the microscopical elements of each being of the same nature; the formative process in the cases of elephas appearing in excess as a diffused disease of the cellular tissue, and in the more common fibro-plastic tumour as a local one, excess of nutritive material and of organizable products existing in both.

Under these circumstances the principle of the operation I have just brought before your notice must be looked upon as rational, and the practice based upon it as scientific; for if the disease of elephas be due to an abnormal effusion of tissue-making elements, to an excess of nutrition in a limb, the attempt to check its progress by the application of a ligature to the main artery by which it lives must be

regarded with favour. But whatever the theory may be upon which the operation has been based, and by whatever process the idea first found expression in the mind of its originator, the practice based upon it must be looked upon as a good one, for the success of the cases which I have just had the pleasure of laying before you has been clear and unequivocal; they tend to show that a new means has been given to the surgeon to cure a loathsome and hitherto incurable affection, and another triumph has been achieved for the science and art of surgery.

DESCRIPTION OF PLATE IV.

Case of Elephantiasis Arabum.

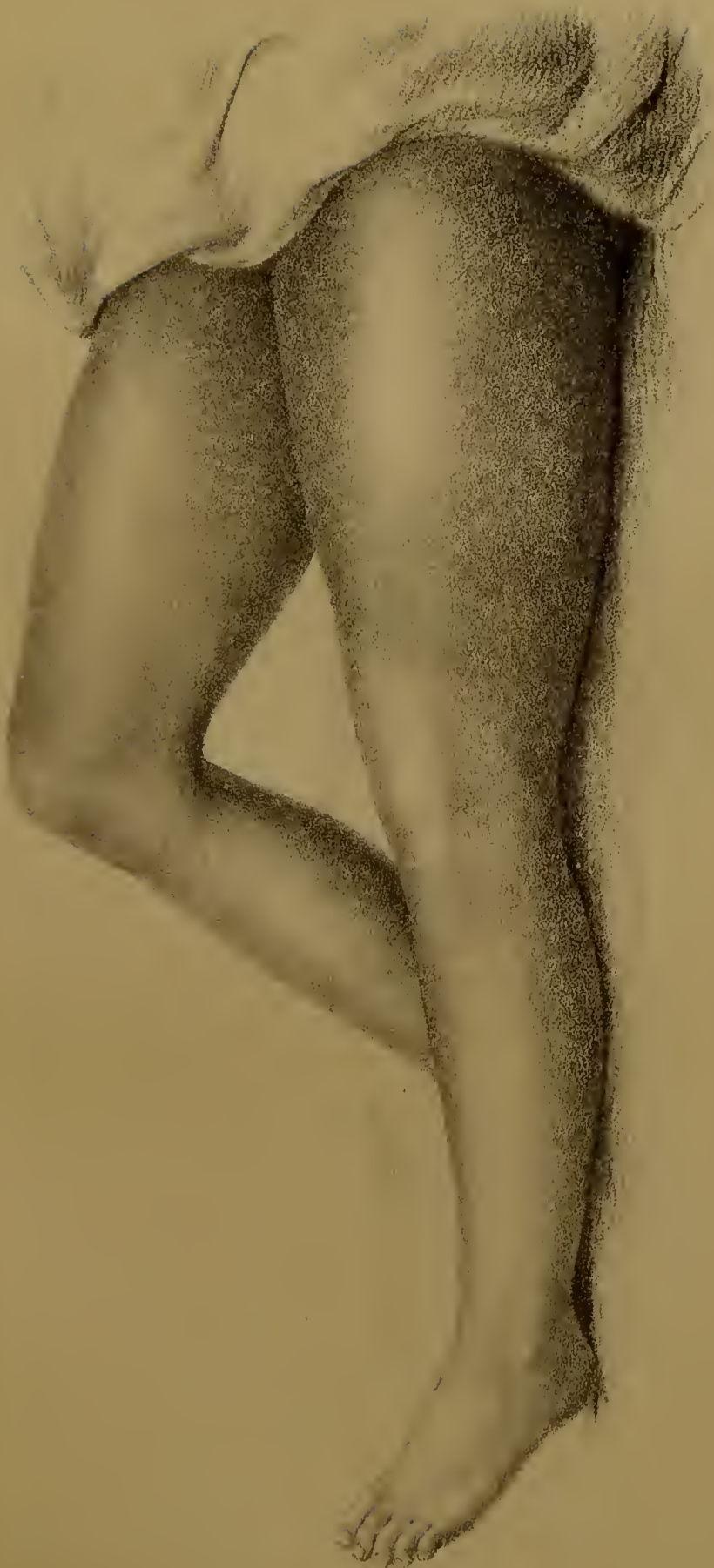
a. 27 inches round thigh.
b. 22½ „ calf.

DESCRIPTION OF PLATE V.

Case of Elephantiasis Arabum after application of a ligature to the external iliac artery.


b
d
c





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